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HANGZHOU REGIONAL CENTRE -

BRIEF REPORT ON PROGRESS SINCE NOVEMBER 1981*

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1. GENERAL INTRODUCTION

The Hangzhou Regional Centre (Asia-Pacific) for Small Hydro Power, also known as HRC, was set up after the signing of the Project Document on 4th November 1981 by UNDP (United Nations Development Programme) and China's Ministry of Foreign Economic Relations and Trade. This Document represents the successful conclusion of several years of preparatory work and discussions at various international conferences and Workshops. With the growing importance of Small Hydro Power (SHP) in the Asia-Pacific Region, there was an increasing need for a SHP Centre to promote regional and international co-operation, and to co-ordinate regional information exchange and technology transfer. In view of its extensive experience in SHP and the Government's positive support, it was considered by participants at several conferences that China was an appropriate choice of location.

The Project Document stipulated that the Chinese side would invest 5.5 million Yuan (RMB) (approx US $2.75 million) for the planned construction of buildings; UNDP would donate US $460,000 for the purchase of equipment.

The main tasks of the Centre are:

1. Training
2. Information
3. Research + Development
4. Advisory and consultancy services

HRC serves both as the national institution for Small Hydro Power (SHP) activities as well as a Regional Centre for the Asia-Pacific region. Furthermore, HRC acts as the Interim Secretariat for the Regional Network on SHP, which consists of Focal Points nominated by

governments in the region. SHP refers to unit capacity of less than 6 MW or total installed capacity of less than 12 MW.

2. MAJOR ACTIVITIES COMPLETED

2.1 Organization, Personnel and Buildings

HRC is based on a national institution i.e. the Institute of Exploitation, Design and Research for SHP. Present technical staff amount to 30 people, of whom 25 are professional engineers (6 senior engineers) in different areas of expertise:

planning
energy
hydrology
hydraulic structures
electrical machinery
hydraulic machinery
economics
geology

Apart from the above, the Centre has a UN consultant under the TOKTEN scheme, Dr.Eugene Chang.

Buildings --- The 1st phase office and accommodation buildings have been completed. See section 4 for details of the second phase.

Equipment and spares funded by UNDP amount to US $400,000, and some of the major items include:

audio-visual equipment
language laboratory system
microfilm system
photocopying and duplicating equipment
micro-computer
simultaneous translation system
vehicles
colour processing equipment

2.2 Main Work Activities

During the present phase of establishment of the Centre, the following tasks were accomplished;

Meetings and Training:

12/7/82 - 17/7/82. Senior Experts Meeting on SHP in the Asia-Pacific Region, held at Hangzhou. 12 participants from 10 developing countries plus related UN personnel attended. SHP training, information and research priorities were discussed, plus the setting-up of a regional network and the 1982-84 work programme of HRC.

22/5/83 - 23/6/83. 1st Training Workshop on SHP for Asia-Pacific region, held at Hangzhou and sponsored by UNDP, UNIDO, ESCAP, RCTT and HRC. 14 participants from 8 countries attended. 11 volumes of teaching materials were prepared by HRC. 13 Chinese and 4 foreign lecturers participated. The Workshop achieved very good results and was highly commended by all those who attended.

May 1983. REDP Steering Committee met in Bangkok, and following their decisions, HRC assumed the role of Interim Secretariat of the Regional Network (RN-SHP). HRC's Director Mr.Zhu Xiaozhang has also taken on the post of Co-ordinator for an interim period. The Co-ordinator sent out a formal letter to over 20 countries in the Region, and has so far received nominations for SHP Focal Points from Fiji, Malaysia, Philippines, Thailand, Indonesia, Pakistan, Sri Lanka, Nepal and Papua New Guinea.

Feb.1984. Conghua Study Tour. HRC helped to host a four-day Study Tour of 10 SHP stations in Conghua, Guangdong Province. The 24 participants came from 8 countries and had just attended the 1st International Conference on Small Hydro, organised by "International Water Power and Dam Construction".

3/9/84 - 14/9/84. 2nd Training Workshop on SHP for the Asia-Pacific region (Hydrology), held at Hangzhou, and sponsored by UNDP,

UNIDO and HRC. 12 participants from 9 countries attended, and there were 3 Chinese and 1 Norwegian lecturer. Practical excercises, discussions, case studies and site visits were also included in this activity. Copies of the comprehensive lecture notes are available for sale.

Information Work:

a) "Development of SHP in China". This paper has been published in Renewable Sources of Energy Vol IV. "SHP Development", ECDC-TCDC, ESCAP/UNIDO.

b) "Summary of development and future trends in SHP world-wide" (in Chinese). This book has been edited and published by HRC.

c) Various papers have been written for international conferences and magazines e.g.
"The Experiences of Small Hydro Power Construction in China" --- First China-US Conference on Energy, Resources and Environment, (Nov.1982)
"Cascade Development and Multi-purpose Utilization of Small Rivers" --- First International Conference on Small Hydro, Singapore (Feb 1984)
"China's Small Hydro makes Big Impact on Rural Areas" published in "World Water" (June 1984)
"How SHP is helping China's rural electrification programme" --- prepared for Energy REsearch Group IDRC, Canada (Sept 1984)
"SHP and Rural Grids" --- TEPCON'84, Teheran (Oct 1984)
"Planning and operation of a local grid where small hydro is the main power source"
"Medium and small masonry arch dams in China" --- both prepared for "Water Power + Dam Construction", and planned for publication in Feb. 1985.

d) 11 volumes of teaching material for the 1st Training Workshop have been produced, and are being edited for future publication.

f) The first SHP Newsletter manuscript was completed in October 1983, and printed and distributed by UNIDO, Vienna in May 1984. The Second issue was distributed in Nov 1984. Future issues are available on request.

g) Currently collecting information to produce a roster of international SHP experts, research organizations, equipment manufacturers etc.

Apart from the above, 9 video films on various aspects of SHP have been produced.

Co-operative Research and Development:

Electronic Load Controller --- In Sept 1982, HRC collaborated with Intermediate Technology Development Group (ITDG), UK, on a project on the application of a 60 kW electronic load controller. After 330 hours of field operation, it was concluded that the controller was technically very good but produced some waveform distortion of the output voltage. The cost was a few times higher than a Chinese-made governor; however, the possibility of a licensing arrangement for local assembly of controller kits in China is being explored under a new project co-sporsored by UNDP/UNIDO/REDP/ITDG/HRC and selected Asia-Pacific countries. The locally assembled controllers will be field tested in China and other countries in the Region, with particular emphasis on finding economic end-uses for the ballast load.

SHP Automation and Remote control --- On-site investigations have been completed, and a suitable station site on the Panxi River, Zhejiang Province, consisting of 5 cascade stations has been selected. Various institutes in China are co-operating in this project, and the Ministry of Water Resources and Electric Power has formally approved the project and contributed towards the project budget. Design of system hardware and software is almost complete. Project design and equipment specification for a SCADA system and programmable controllers for purchase abroad are complete, and actual field work on machine set renovation has already started. For this project, we have engaged the help of another UN TOKTEN consultant, Dr.A.S.Tseng. The aim of the project is to develop a system to give an intermediate level of automation, appropriate to the needs of developing countries.

Consultancy services:

Two Chinese Senior Engineers carried out a one month field study in Vermont, USA to prepare a renovation scheme for an abandoned SHP site. Their proposed scheme was cheaper than those from US firms and also conformed with the strict local environmental requirements.

Liaison with other organizations and individuals:

Over 80 overseas guests have visited the Centre including various UN officials, university professors, SHP engineers and experts. In addition we are gradually building up a list of contacts and sister organizations around the world, and have a mailing list with names from over 50 countries at present.

Furthermore, a 3-man Consultation Mission of the RN-SHP Secretariat visited 4 Asia-Pacific countries in Oct/Nov 1984 to strengthen ties in the Network and exchange ideas on future activities.

3. WORK FOR THE NEXT PHASE

HRC's Work Programme for the near future includes the following main tasks:

Training

Every year, 1-2 courses are to be held. A training Workshop on Analysis of Economic Feasibility of SHP is scheduled for Nov 1985.

Video recording of further training films on selected topics to supplement the teaching materials of the 1st Training Workshop.

Information work

SHP Newsletter to be produced quarterly. Copies are available on request. We welcome contributions from the Region especially on practical examples of appropriate technology in the field of SHP.

Editing and publishing a roster of SHP experts, equipment manufacturers, SHP bibliography and list of SHP stations in operation. The data is to be stored in our in-house computer for easy information retrieval.

Preparation of special issue on SHP in China, to be published in "International Water Power and Dam Construction" early 1985.

Preparatory work for the 2nd International Small Hydro conference to be held in Hangzhou, China 1986, and co-sponsored by "International Water Power and Dam Construction".

Translation of abstracts of articles on SHP published in Chinese journals.

Policy-making

A high-level seminar on national SHP policies and regional co-operation is planned in conjunction with the inauguration ceremony of new RN-SHP office premises in the 4th quarter of 1986.

Research and Development

--- Completion of the pilot project on remote control of river cascade development stations
--- Further research on the application of electronic load controllers
--- Investigation of network planning in China's rural electrification programme.
--- Other topics as proposed by Asia-Pacific countries

Short-term consultancy and visits

It is expected that several short-term consultancy visits will be made, including some to developing countries for the UN-DTCD programme on the evaluation of small hydropower resources. Consultancy visits can also be made between RN-SHP Network members for exchange of experience. Furthermore, consultancy teams may draw on experts from several countries in the Region.

4. LOOKING AHEAD

Completion of the Centre's buildings has been delayed for various reasons. However, the Ministry of Water Power and Electric Resources has now resolved to accelerate the construction and hence final completion of the Centre. This has been combined with a modified organizational structure to suit the Centre's needs.

In this second phase, new buildings are under construction with floor area 10,000 m^2, of which 6,000 m^2 will be a new block for training, information, research and offices together with guest accommodation. This is planned for completion in the second half of 1986, and will provide up-to-date facilities including conference hall, language laboratory, reference library and video film studio.

HRC welcomes future co-operation with sister SHP organizations in any part of the world. We are having increasing contact with interested parties not just from within our Regional Network but from countries all over the world. We are also exploring various forms of co-operation, including bilateral and multi/bilateral contacts.

We hope that this growing international co-operation in the field of Small Hydro Power will help to promote the application of SHP technology, a technology which is, after all, appropriate to both the developing and developed countries.